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DEPARTMENT OF HEALTH AND HUMAN SERVICES

Centers for Disease Control and Prevention

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Agency Forms Undergoing Paperwork Reduction Act Review

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**Proposed Project**

Field Evaluation of Prototype Kneel-assist Devices in Low-seam Mining (0920-0843, Expiration 1/31/2013) - Extension - National Institute for Occupational Safety and Health (NIOSH), Centers for Disease Control and Prevention (CDC).

**Background and Brief Description**

NIOSH, under P.L. 91-596, Sections 20 and 22 (Section 20-22, Occupational Safety and Health Act of 1970) has the responsibility to conduct research relating to innovative methods, techniques, and approaches dealing with occupational safety and health problems.

According to the Mining Safety and Health Administration (MSHA) injury database, 227 knee injuries were reported in underground coal mining in 2007. With data from the National Institute for Occupational Safety and Health (NIOSH), it can be estimated that the financial burden of knee injuries was nearly three million dollars in 2007.

Typically, mine workers utilize kneepads to better distribute the pressures at the knee. The effectiveness of these kneepads was only recently investigated in a study by NIOSH that has not yet been published. The results of this study demonstrated that kneepads do decrease the maximum stress applied to the knee albeit not drastically. Additionally, the average pressure across the knee remains similar to the case where subjects wore no kneepads at all. Thus, the injury data and the results of this study suggest the need for the improved design of kneel-assist devices such as kneepads. NIOSH is currently undertaking the task of designing more effective kneel-assist devices such as a kneepad and a padded support worn

at the ankle where mine workers can comfortably rest their body weight.

These devices must also be field tested to verify they do not result in body discomfort or inadvertent accidents. It is also important to determine how usable and durable these devices are in the harsh mining environment. In order to quantitatively demonstrate that these prototype devices are superior to their predecessors, mine workers using these prototypes must be interviewed. Their feedback will identify any necessary changes to the design of the devices such that NIOSH can ensure the prototypes will be well-accepted by the mining community.

To collect this type of information, a field study must be conducted where kneel-assist devices currently used in the mining industry (i.e. kneepads) are compared to the new prototype designs. The study suggested here would take approximately 13 months.

Phase I of this study will evaluate the prototype kneel-assist device by mine workers after being used for one month. Iterative changes will be made to the design based on the feedback obtained during Phase I. Data will be collected via interviews with individual mine workers and through a focus group where all mine workers come together to express their opinions about the devices. If the prototype kneel-assist devices do not appear to be successful, the data collected will

be used to adequately redesign them and the above described process will begin again. If the prototype kneel-assist devices appear to be successful, Phase II of the study will commence.

Once Phase II of study is ready to commence, cooperating mines will be identified. Every month, the section foreman at the cooperating mines will be asked to supply some information regarding the current mine environment.

Initially, the mine workers will be given a control kneel-assist device. Currently, mine workers only utilize kneepads as a kneel-assist device. Therefore, only a control kneepad will be provided. They will then be asked some basic demographics information such as their age and time in the mining industry. Additional data will then be collected at 1, 3, and 6 months after the study commences. The mine workers will be asked to provide their feedback regarding factors such as body part discomfort, usability, durability, and ease of movement with respect to the control kneepad. After evaluating the control kneepad, mine workers will then be given the prototype kneel-assist device that was finalized in Phase I of the study. The same questions that were asked about the control kneepad will again be asked at 1,3, and 6 months after usage begins of the prototype. Thus, Phase II of the study will last 12 months.

There will be no cost to the respondents other than their time. The total burden is 216.

Estimated Annualized Burden Hours

	Respondent s	Form Name	No. of Respond ents	No. of Response s per Responde nt	Average Burden per Response (in hours)
Phase I	Section Foreman	Phase I Section Foreman Form	3	1	30/60
	Mine Workers	Phase I Baseline Form	27	1	20/60
	Mine Workers	Phase I 1month form	27	1	30/60
	Mine Workers	Phase I Focus Group Questions	27	1	1
Phase II	Section Foreman	Phase II Section Foreman Form	6	12	10/60
	Mine Workers	Phase II Baseline Form	54	1	20/60
	Mine Workers	Phase II 1, 3, and 6 months forms	54	6	25/60

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